

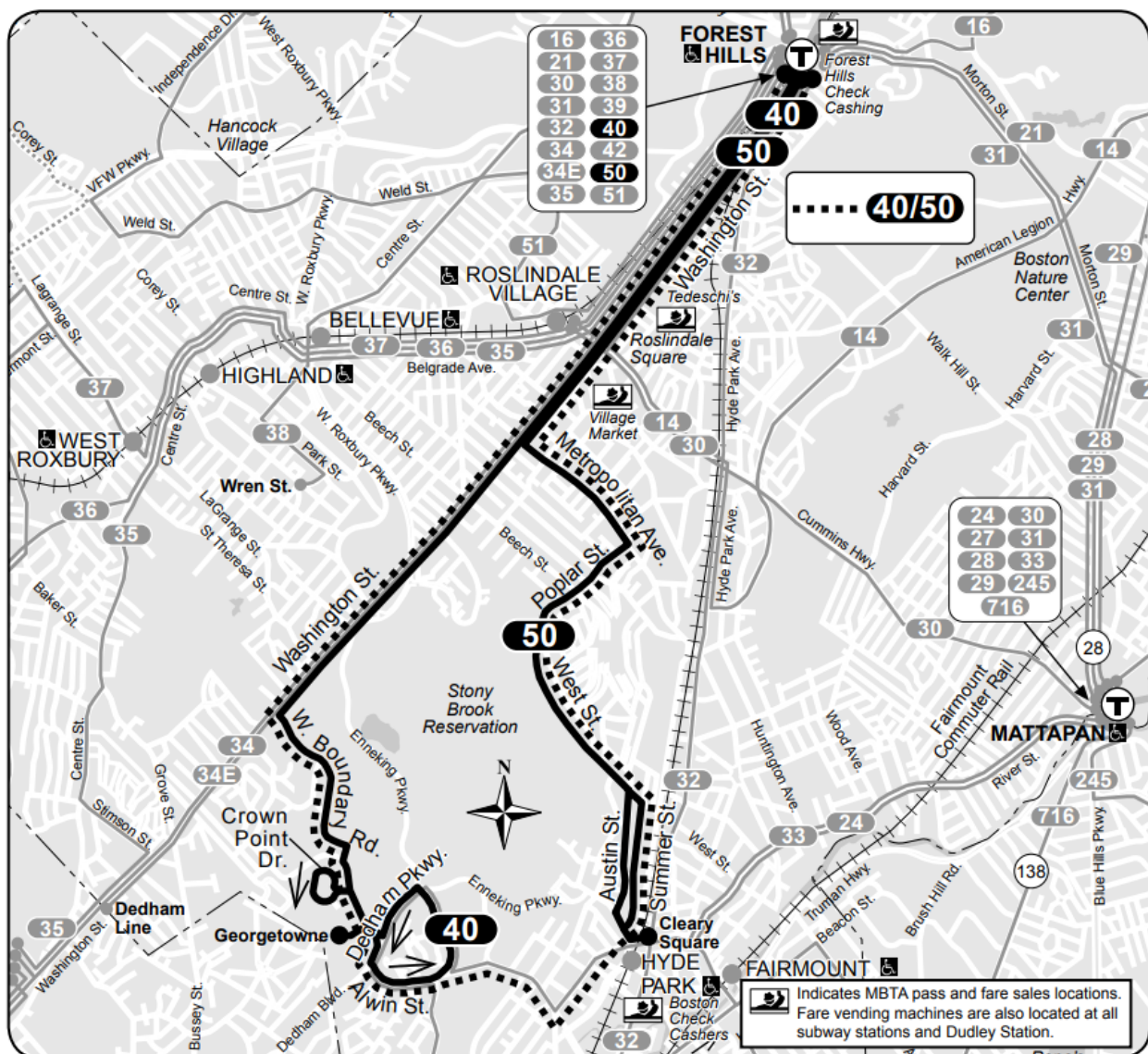
Route 40

Georgetowne – Forest Hills Station

Route Overview

Route 40 Georgetowne - Forest Hills Station is a Local route that operates between West Roxbury's Georgetowne area and Forest Hills Station (see Figure 1). Its major purpose is to connect the Georgetowne neighborhood to the Orange Line at Forest Hills Station.

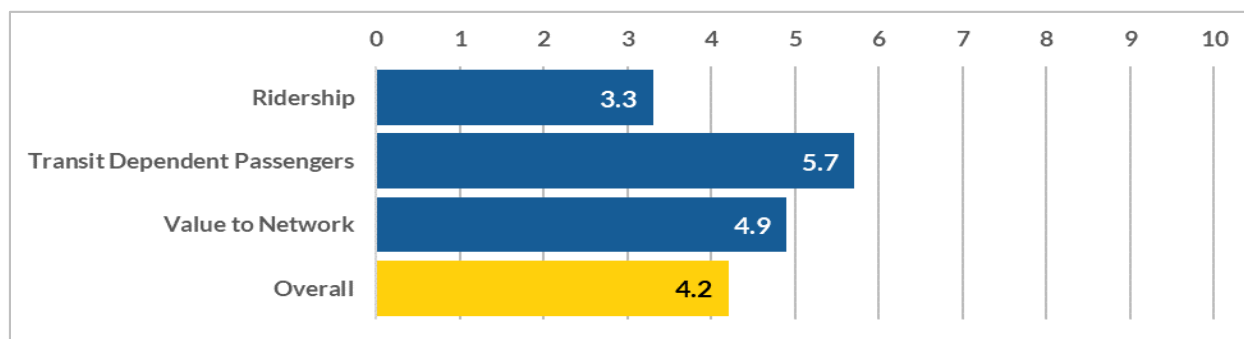
Figure 1 | Service Map



Network Importance

Route 40 is of moderate importance with the overall bus network (see Figure 2). On a relative scale of 0 to 10, the route rates 3.3 in terms of ridership, 5.7 in terms of transit dependent ridership, and 4.9 in terms of its value to the network (which reflects the number of people who are uniquely served, the number of jobs and other important destinations, and the number of transferring passengers). Its overall score, which gives a 70% weight to overall ridership and a 15% weight to both other measures, is 4.2.

Figure 2 | Relative Importance within MBTA Bus Network (on a scale of 0 to 10)



Service Overview

Schedule

Route 40 operates seven days a week and provides infrequent service at nearly all times (see Table 1). On weekdays, Route 40 operates between 5:38 AM and 9:00 PM:

Table 1 | Schedule Statistics

SERVICE DAY	SPAN OF SERVICE	FREQUENCY (RANGE)	FREQUENCY (AVERAGE)	DAILY TRIPS (INBOUND/OUTBOUND)
Monday-Friday	5:38 AM to 9:00 PM			25/25
Sunrise	5:38 AM to 5:59 AM	21	21	2/2
Early AM	6:00 AM to 6:59 AM	25	25	2/3
AM Peak	7:00 AM to 8:59 AM	25	25	4/3
Midday Base	9:00 AM to 1:29 PM	35 - 60	53	5/5
Midday School	1:30 PM to 3:59 PM	22 - 39	26	4/5
PM Peak	4:00 PM to 6:29 PM	25	25	4/4
Evening	6:30 PM to 9:00 PM	25	25	4/3
Late Evening	10:00 PM to 11:59 PM	-	-	-
Night	-	-	-	-
Saturday	6:25 AM to 8:00 PM	60	60	16/16
Sunday	10:30 AM to 5:00 PM	60	60	8/8

Note: Span of service reflects the time the first bus begins service until the time the last bus finishes service.

- Every 25 minutes during the Early AM and AM Peak periods.
- Every 35 to 60 minutes in the Midday Base period, with average headways of 53 minutes.
- Every 22 to 39 minutes in the Midday School period, with average headways of 26 minutes.
- Every 25 minutes in the PM Peak and Evening periods.

On Saturdays, Route 40 operates between 6:25 AM and 8:00 PM every 60 minutes. On Sundays, Route 40 operates between 10:30 AM and 5:00 PM, also every 60 minutes.

Route 40 meets the service frequency standards on all days. It meets the service span standards on weekdays and Saturdays, but not on Sundays, when service operates from 10:30 AM to 5:00 PM versus the standard of 10:00 AM to 6:30 PM.

Service Patterns

All weekday service and Saturday service before 4:50 AM inbound and 4:20 PM outbound operates between Georgetowne and Forest Hills Station (see Table 2). However, there are some differences in how the outer loops are served:

- In the AM, outbound service operates directly to 84 Georgetowne Place (identified as Georgetowne in Figure 1), without serving the Crown Point Drive loop. Inbound service then starts service by operating around the outer loop and then via the Crown Point Drive loop (Pattern 40.2).
- In the PM, the pattern is reversed, with outbound trips serving the Crown Point Drive loop and the outer loop. Inbound service then operates directly along West Boundary Road to Washington Street and then to Forest Hills Station (Pattern 40.0).
- The last two outbound trips at 8:00 PM and 9:00 PM do not serve either the Crown Point Drive loop or the outer loop. Instead, from 84 Georgetowne Place, these trips continue to Cleary Square along Alwin Street. These trips return inbound as Route 50 Cleary Square – Forest Hills Station (Pattern 40.5).

On weekends, Saturday service after 4:50 PM inbound and 4:20 PM outbound and all Sunday service operates as a combination of Routes 40 and 50. This service operates outbound from Forest Hills Station via Route 40's alignment to Georgetowne, and then to Cleary Square. It then operates inbound via Route 50's alignment (Pattern 40.5). This service is shown with the dotted line in Figure 1.

Table 2 | Service Patterns

PATTERN	ORIGIN	DESTINATION	UNIQUE FEATURE	TRIPS PER WKD	TRIPS PER SAT	TRIPS PER SUN
INBOUND				25	16	8
40.0	84 Georgetowne Place	Forest Hills Station	PM service to Forest Hills Station without serving outer loop or Crown Point Drive loop	11	12	-
40.2	84 Georgetowne Place	Forest Hills Station	AM service via Crown Point Drive loop and outer loop	12	-	-
40.5	Cleary Square	Forest Hills Station	Sunday and Saturday evening inbound service via Route 50's alignment	2	4	8
OUTBOUND				25	16	8
40.0	Forest Hills Station	84 Georgetowne Place	PM service via Crown Point Drive loop and outer loop	11	12	-
40.2	Forest Hills Station	84 Georgetowne Place	AM service that does not serve the Crown Point Drive loop or outer loop	12	-	-
40.5	Forest Hills Station	Cleary Square	Sunday and Saturday evening outbound service via Route 40's alignment with continuing service to Route 50's inbound alignment	2	4	8

Ridership

Route 40 carries 1,430 passengers on weekdays, 600 passengers on Saturdays, and 300 passengers on Sundays.

Ridership by Stop

Route 40's ridership largely consists of those traveling to and from the Georgetowne area and those who ride "opportunistically" along Washington Street when a Route 40 bus is the first to arrive at their stop. The large majority of all passengers travel to and from Forest Hills Station. On weekday inbound service (see Figure 3):

- A total of 250 passengers board on the outer segment of Route 40 that provides unique service:
 - 210 passengers, or 35% of all inbound passengers, board on the Georgetowne outer loop.

- 30 passengers board at the single stop on the Crown Point Drive loop (which is a two-minute walk from the closest stop that is not on the loop).
- 10 passengers board along West Boundary Road.
- 340 passengers board and 120 alight along Washington Street between West Boundary Road and Forest Hills Station. The 340 boarding passengers are opportunistic passengers who take Route 40 when it is the first bus to arrive at their stop on Washington Street, which depending upon location, is served by up to eight other routes.
- 600 passengers, or 77% of all inbound riders, alight at Forest Hills Station.

Outbound ridership is roughly the reverse of inbound ridership on weekdays.

Patterns on regular Saturday service before 4:50 PM inbound and 4:20 PM outbound are similar, but with lower volumes. After those times, when service is provided with the Route 40/50 loop, there are 15 boardings and 50 alightings between Washington Street and Georgetowne on four round trips. On Sundays, there are 60 boardings and 50 alightings on eight round trips.

Ridership by Trip

Route 40's weekday ridership is dominated by typical peak hour commuting patterns, with high ridership per trip occurring inbound in the AM peak and outbound in the PM peak (see Figure 4 and Figure 5). On weekday inbound trips:

- Ridership starts high at 46 passengers on the first inbound trip at 5:38 AM, which indicates demand for earlier service. Ridership then remains at over 40 passengers per trip through 9:00 AM. Three trips before 7:00 AM have loads that exceed the MBTA loading standards.
- Ridership per trip then declines to 20 to 30 passengers per trip through approximately 3:30 PM.
- It then declines further to fewer than 10 passengers per trip by 6:00 PM, where it remains until the end of service.

Figure 3 | Weekday Inbound Ridership by Stop Map



Figure 4 | Weekday Ridership by Trip: Inbound

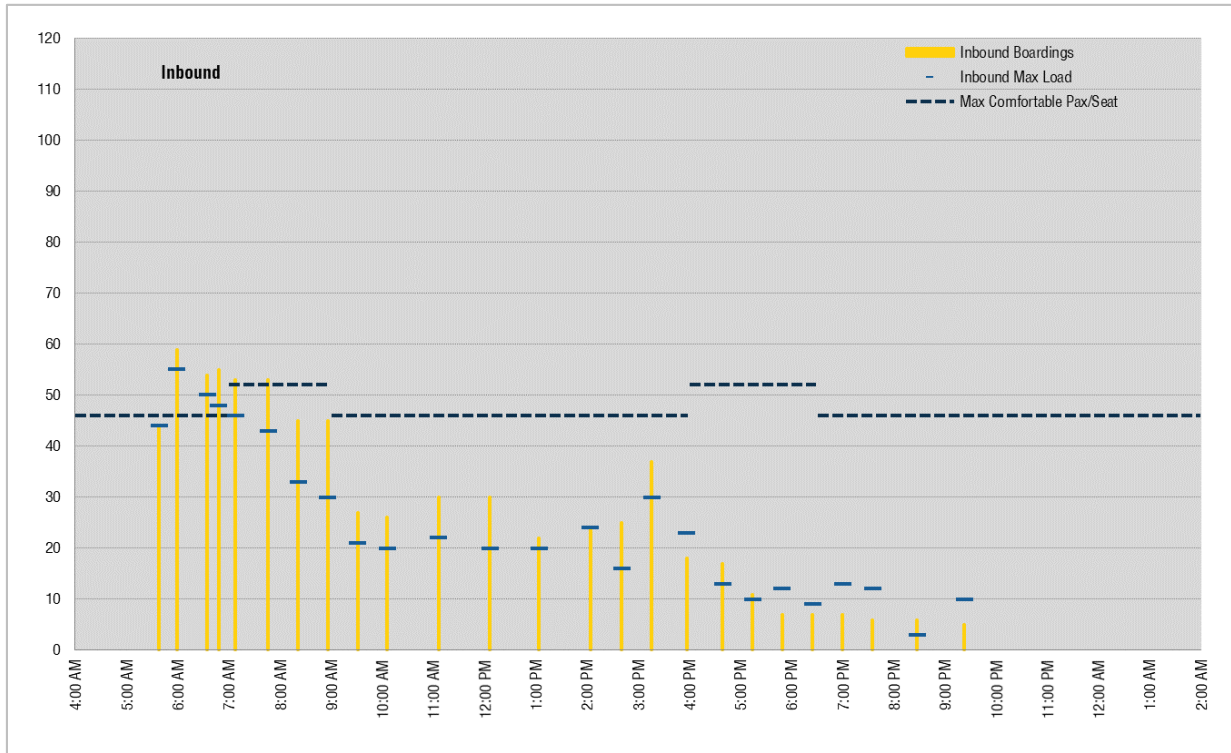
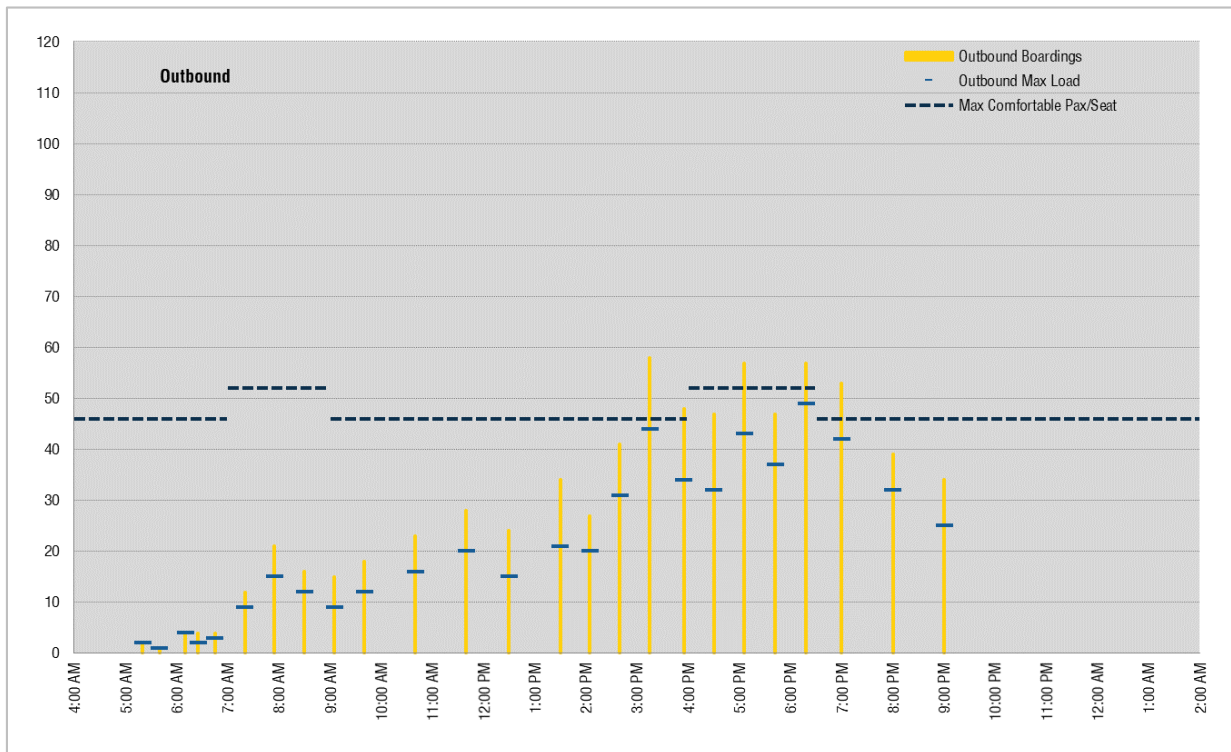


Figure 5 | Weekday Ridership by Trip: Outbound



On weekday outbound trips:

- In the morning and early afternoon until 1:00 PM, ridership per trip is low, generally at 20 passengers or fewer.
- After 1:00 PM, ridership per trip begins to increase, to over 30 passengers by 2:30 PM and to 40 shortly before 3:00 PM.
- Ridership per trip is then close to or over 50 passengers per trip until 7:00 PM.
- It then declines marginally to 35 passengers on the last trip at 9:00 PM. High ridership on this last trip indicates demand for later service.

On Saturdays, ridership per trip is low to moderate (see Figure 6 and Figure 7). Inbound, few trips carry over 20 passengers. Outbound ridership starts very low, with most morning trips carrying fewer than 20 passengers. It then increases to around 30 passengers on most PM trips.

Sunday ridership is also low to moderate (see Figure 8 and Figure 9). Most inbound trips carry 10 to 20 passengers, and most outbound trips carry slightly over 20 passengers.

Figure 6 | Saturday Ridership by Trip: Inbound

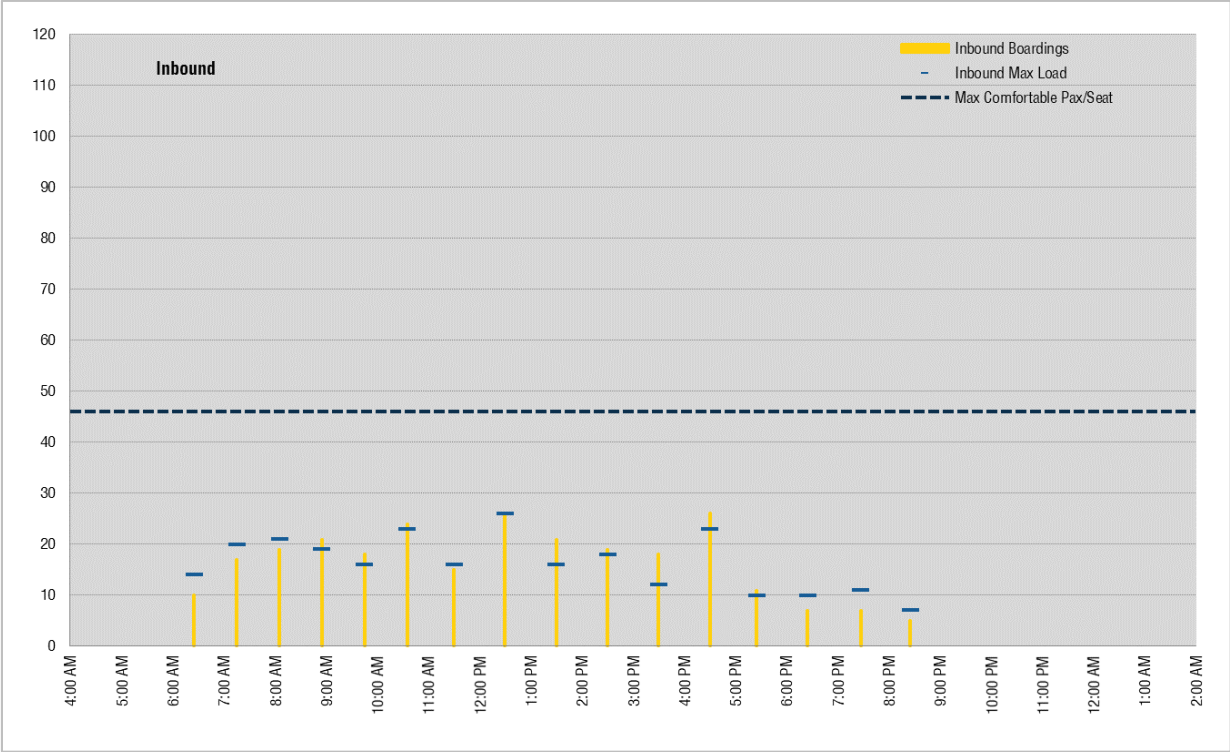


Figure 7 | Saturday Ridership by Trip: Outbound

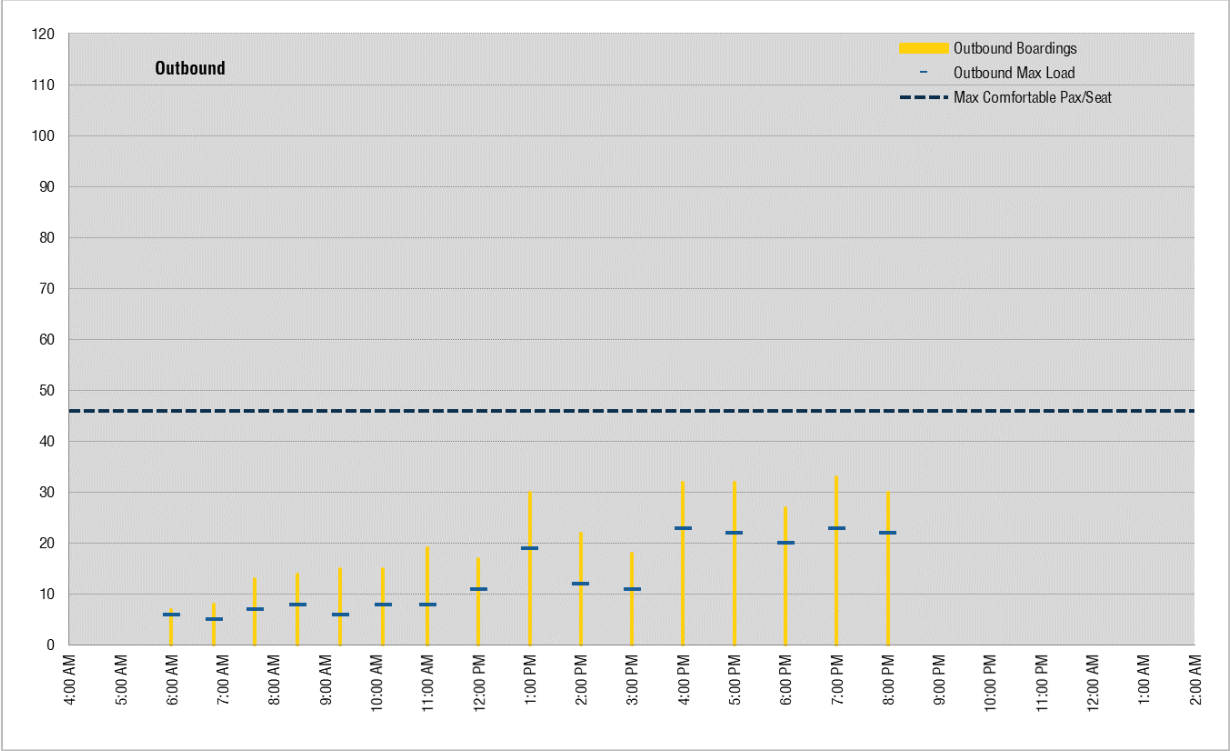


Figure 8 | Sunday Ridership by Trip: Inbound

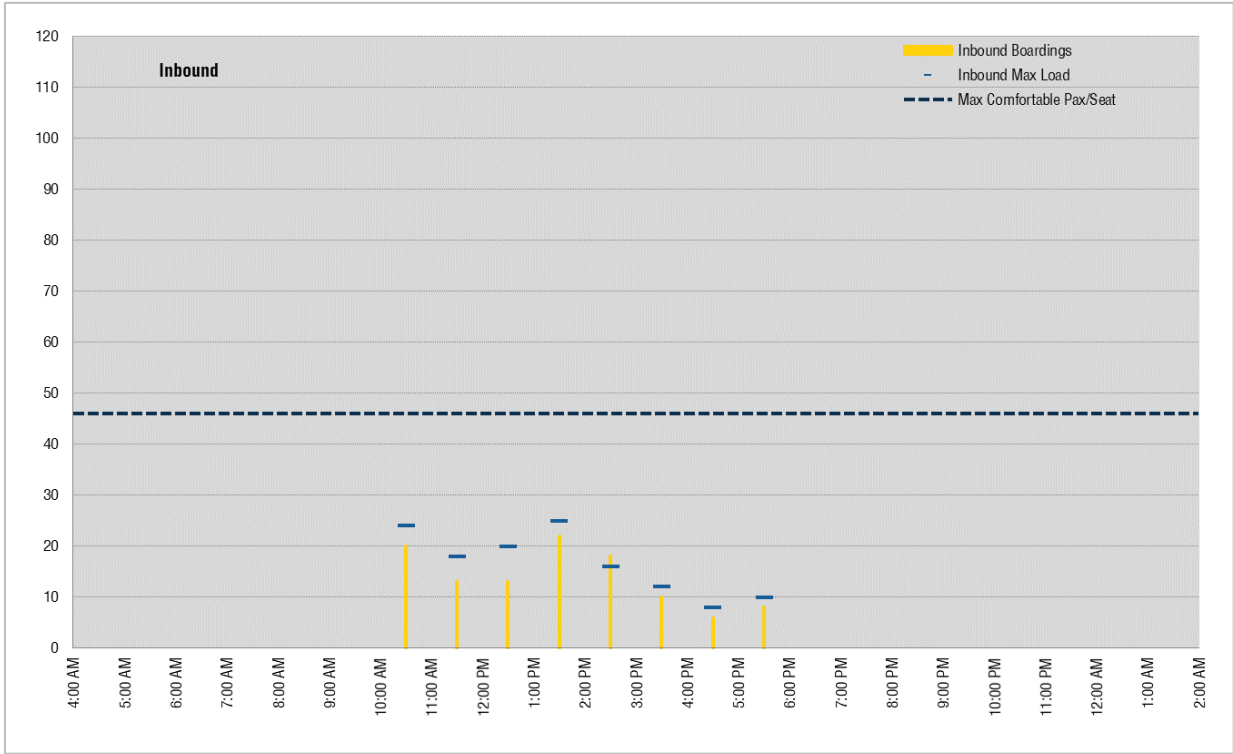
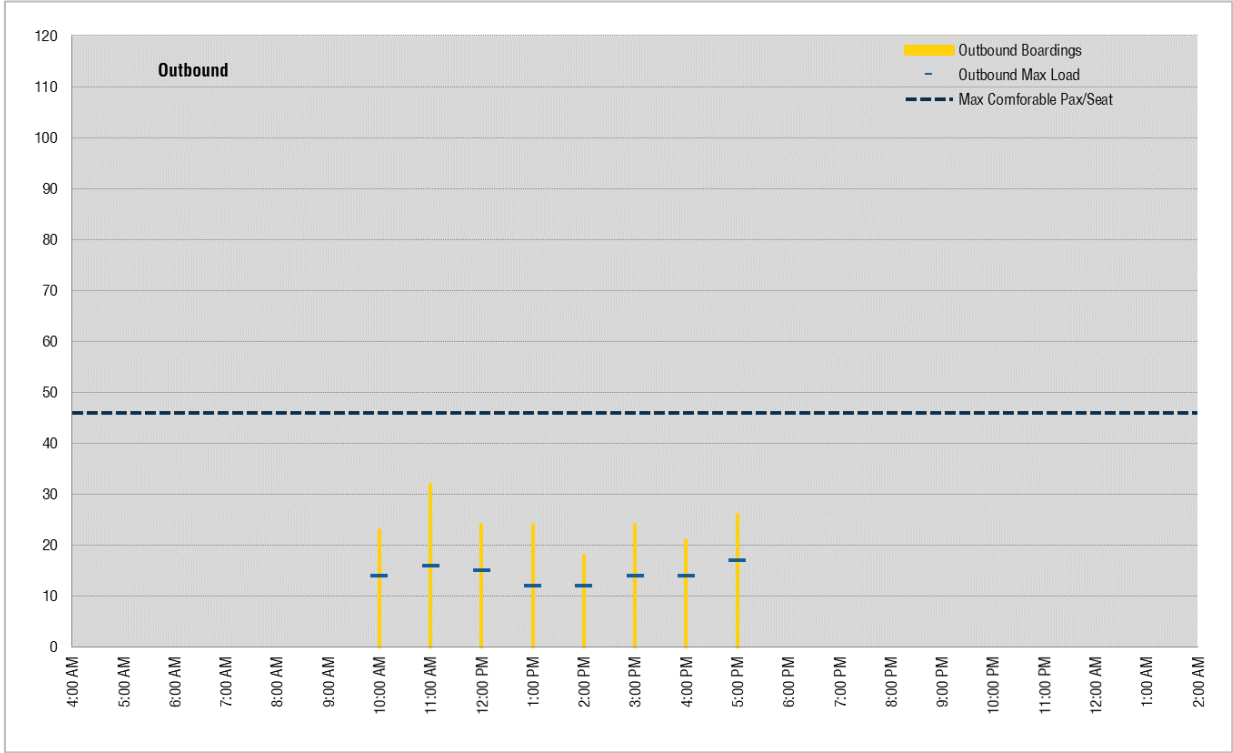


Figure 9 | Sunday Ridership by Trip: Outbound



Passenger Comfort

The MBTA desires that passengers travel in relatively comfortable conditions. At the same time, the MBTA’s definition of comfort reflects the very high volume environment in which the MBTA operates, and that some passengers may have to stand for a portion of their trip. More specifically, at least 92% of passengers’ travel times should be in comfortable conditions, and ideally, at least 96% of travel times should be in comfortable conditions. Comfortable conditions are considered to be 140% or less of seated capacity during high volume periods and 125% or less during other periods.

On Route 40, 90% of passenger minutes are in comfortable conditions, which is below the minimum standard of 92% (see Table 4). This is due to overcrowding on some early morning inbound trips and poor on-time performance.

Table 3 | Passenger Time Spent Traveling in Comfortable Conditions

	WEEKDAYS	SATURDAYS	SUNDAYS
Minimum Standard	92%	92%	92%
Target	96%	96%	96%
Actual	90%	100%	-

Reliability and Speed

Reliability

Route 40’s weekday and Saturday overall on-time performance of 53% and 65%, respectively, is poor and falls well below the MBTA’s minimum standard of 70% for Local routes (see Table 5). Sunday’s overall reliability of 74% is above the minimum standard but just below the target of 75% for local routes. Dropped trips are a minor issue on Route 33, with approximately 0.3% of trips not operated in Fall 2017.

Table 4 | Reliability

SERVICE DAY	ORIGIN/MID-ROUTE ON-TIME PERFORMANCE	DESTINATION ON-TIME PERFORMANCE	OVERALL RELIABILITY	DROPPED TRIPS
Monday - Friday	50%	72%	53%	0.3%
Saturday	65%	64%	65%	-
Sunday	72%	81%	74%	-

Running Times

Route 40 operates behind schedule throughout the day. In the AM, inbound times are eight to 10 minutes longer than scheduled, and in the PM, outbound times are three to seven minutes longer (see Figure 10 and Figure 11).

Figure 10 | Scheduled & Median Travel Time by Trip: AM Inbound

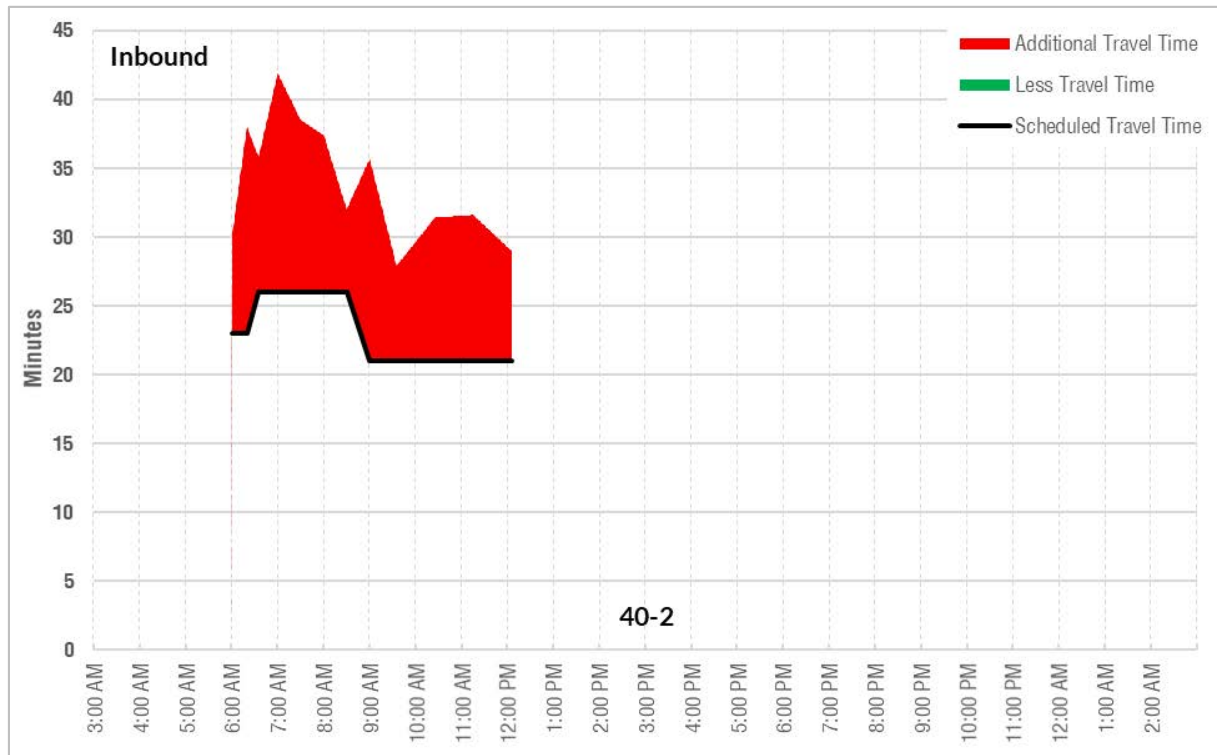
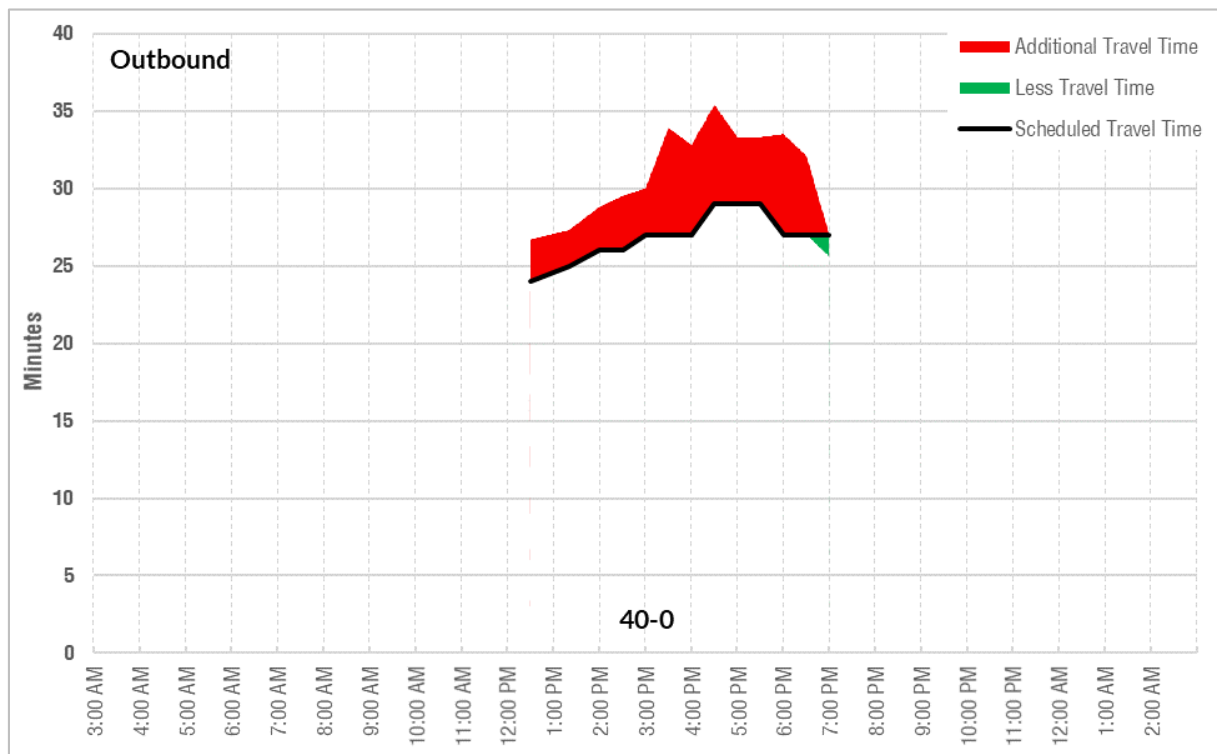


Figure 11 | Scheduled & Median Travel Time by Trip: PM Outbound



Stop Spacing

Route 40 averages seven stops per mile, which is at the top end of the four to seven stops per mile recommended for urban areas under MBTA guidelines. Close stop spacing is a particular issue on Washington Street and stop consolidation could make service faster and improve reliability on Route 40, as well as other routes that serve Washington Street.

Summary

Route 40 provides unique service to West Roxbury's Georgetowne area, where transit demand is moderate. It also travels through high demand areas along Washington Street, but this corridor is served by several other routes that provide much more service, and thus the proportion of that demand that Route 40 serves is small.